frequency detection means for detecting a frequency at which the flow rate of the fluid varies; and

number-of-times change means for changing the predetermined number of repetition times according to the frequency detected by the frequency detection means.

71. (NEW) A flowmeter according to claim 70, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of a sonic wave as the state change of the fluid.

72. (NEW) A flowmeter according to claim 70, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of heat as the state change of the fluid.

73. (NEW) A flowmeter according to claim 70, further comprising elapsed time detection means for detecting an elapsed time for the state change of the fluid based on an output from the time measurement means,

wherein the frequency detection means detects the frequency based on the output from the elapsed time detection means.

74. (NEW) A flowmeter according to claim 70, wherein the number-of-times change means sets the predetermined number of repetition times so as to be substantially a multiple of a cycle of the frequency.

75. (NEW) A flowmeter according to claim 70, further comprising data holding means for holding the output from the elapsed time detection means,

wherein the frequency detection means detects the frequency based on a comparison between data held by the data holding means and data of the propagation time measured by the time measurement means.

76. (NEW) A flowmeter according to claim 70, wherein the number-of-times change means is operated when predetermined processing is performed.

77. (NEW) A flowmeter according to claim 76, wherein the number-of-times change means is operated every time the flow rate detection means performs flow rate measurement.

78. (NEW) A flowmeter according to claim 76, wherein the number-of-times change means changes the predetermined number of repetition times before the flow rate detection means performs the flow rate measurement.

79. (NEW) A flowmeter according to claim 76, wherein the predetermined processing includes: abnormality determining processing for determining whether the flow rate detected by the flow rate detection means is abnormal or note; and flow rate management processing for managing a use state of the flow rate.

80. (NEW) A flowmeter according to claim 70, wherein the predetermined number of repetition times is used when the flow rate detection means next detects the flow rate.

81. (NEW) A flowmeter according to claim 70, wherein the number-of-times change means is operated when the flow rate detected by the flow rate detection means is smaller than a predetermined flow rate.

82. (NEW) A flowmeter, comprising:

transmission/reception means for transmitting/receiving a signal using a state change of fluid that flows in a flow path;

time measurement means for measuring a propagation time of a state change of the fluid during when the signal is transmitted/received by the transmission/reception means;

flow rate detection means for detecting a flow rate of the fluid based on the propagation time measured by the time measurement means;

variation detection means for detecting a pressure variation in the flow path based on an output from the transmission/reception means; and

selection means which switches an output of the transmission/reception means so as to allow the output from the transmission/reception means to be used for detecting a flow rate of the fluid and for detecting a pressure variation in the flow path.

83. (NEW) A flowmeter according to claim 82, further comprising measurement control means for starting measurement in synchronization with a timing of the pressure variation detected by the variation detection means.

84. (NEW) A flowmeter according to claim 82, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of a sonic wave as the state change of the fluid.

85. (NEW) A flowmeter according to claim 82, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of heat as the state change of the fluid.

86. (NEW) A flowmeter according to claim 82, wherein:

the transmission/reception means includes first vibration means provided in an upstream side of the flow path for transmitting/receiving a sonic wave and second vibration means provided in a downstream side of the flow path for transmitting/receiving a sonic wave;

the variation detection means detects the pressure variation based on an output from at least one of the first vibration means and second vibration means;

the flowmeter further includes:

switching means for switching a transmission/reception operation of the signal by the first vibration means and second vibration means, and

measurement control means for controlling the time measurement means such that, when a predetermined pressure variation is detected by the variation detection means, a first measurement time T1 which is required for transmitting the state change of the fluid from the first vibration means to the second vibration means is measured, and when a pressure variation whose direction is opposite to that of the predetermined pressure variation is detected by the variation detection means, a second measurement time T2 which is required for transmitting the state change of the fluid from the second vibration means to the first vibration means is measured,

wherein the flow rate detection means detects the flow rate of the fluid by using the first measurement time T1 and the second measurement time T2.

87. (NEW) A flowmeter according to claim 86, wherein:

the measurement control means performs measurement control such that, when the predetermined pressure variation is detected by the variation detection means, the measurement of the first measurement time T1 is started, and when the pressure variation whose direction is opposite to that of the predetermined pressure variation is detected by the variation detection means, the measurement of the second measurement time T2 is started, and in a next measurement time, when the pressure variation whose direction is opposite to that of the predetermined pressure variation is detected by the variation detection means, next measurement of the first measurement time T1 is started, and when the predetermined pressure variation is detected by the variation detection means, next measurement of the second measurement time T2 is started; and

the flow rate detection means detects a first flow rate of the fluid using the first measurement time T1 and the second measurement time T2, detects a second flow rate of the fluid using the first measurement time T1 and the second measurement time T2 which are measured in the next measurement time, and detects a flow rate of the fluid by averaging the first flow rate and the second flow rate.

88. (NEW) A flowmeter according to claim 82, further comprising repetition means for repeating the transmission/reception of the signal by the transmission/reception means for a predetermined number of repetition times.

89. (NEW) A flowmeter according to claim 88, wherein the repetition means repeats the transmission/reception of the signal over a time period which is a multiple of a cycle of a frequency of the pressure variation.

90. (NEW) A flowmeter according to claim 88, wherein the repetition means starts the transmission/reception of the signal when a predetermined pressure variation is detected by the variation detection means, and repeats the transmission/reception of the signal until a pressure variation which is the same as the predetermined pressure variation is next detected by the variation detection means.

91. (NEW) A flowmeter according to claim 82, wherein the variation detection means detects a near-zero portion of an alternating component having a waveform which indicates a pressure variation in the flow path.

92. (NEW) A flowmeter according to claim 82, further comprising: a frequency detection means for detecting the frequency of the pressure variation detected by the variation detection means; and measurement control means for starting flow rate measurement when a frequency detected by the frequency detection means equals a predetermined frequency.

93. (NEW) A flowmeter according to claim 82, further comprising detection cancellation means for automatically starting flow rate measurement after a predetermine time period when the pressure variation cannot be detected by the variation detection means.

94. (NEW) A flowmeter according to claim 86, wherein each of the first vibration means and second vibration means includes a piezoelectric transducer.

95. (NEW) A flowmeter, comprising:

transmission/reception means for transmitting/receiving a signal using a state change of fluid that flows in a flow path;

repetition means for repeating the transmission/reception of the signal by the transmission/reception means a predetermined number of times;

time measurement means for measuring a propagation time of a state change of the fluid during when the transmission/reception of the signal is repeated by the repetition means;

flow rate detection means for detecting a flow rate of the fluid based on the propagation time measured by the time measurement means;

variation detection means for detecting a pressure variation in the flow path;

measurement control means for controlling each of the transmission/reception means, the repetition means, the time measurement means, the flow rate detection means, and the variation detection means; and

measurement monitoring means for monitoring a time signal relevant to a measurement timing of each of the transmission/reception means, the repetition means, the time measurement means, the flow rate detection means, and the variation detection means, or monitoring the number of times that the transmission/reception of the signal is repeated.

96. (NEW) A flowmeter according to claim 95, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of a sonic wave as the state change of the fluid.

97. (NEW) A flowmeter according to claim 95, wherein the transmission/reception means transmits/receives the signal by utilizing propagation of heat as the state change of the fluid.

98. (NEW) A flowmeter according to claim 95, wherein:

the transmission/reception means includes a pair of vibration means for transmitting/receiving a sonic wave;

the measurement control means outputs a start signal which directs commencement of transmission of a sonic wave when a first output signal is output from the variation detection means, and outputs an end signal which directs conclusion of a repetition of transmission/reception of a sonic wave when a second output signal is output from the variation detection means; and

the measurement monitoring means monitors abnormality in measurement timings of the start signal and end signal.

99. (NEW) A flowmeter according to claim 98, wherein, at a measurement timing where the start signal is not issued within a predetermined time period after the direction of the measurement control means, the measurement monitoring means directs commencement of transmission of a sonic wave after a predetermined time has been passed.

100. (NEW) A flowmeter according to claim 98, wherein, at a measurement timing where the start signal is not issued within a predetermined time period after the direction of the measurement control means, the measurement monitoring means directs commencement of transmission of a sonic wave after a predetermined time has been passed, and directs repetition of the transmission/reception of the sonic wave for the predetermined numbers of repetition time.

101. (NEW) A flowmeter according to claim 98, wherein, at a measurement timing where the start signal is not issued within a predetermined time period after the direction of the measurement control means, the measurement monitoring means does not perform flow rate measurement until a next direction is issued by the measurement control means.

102. (NEW) A flowmeter according to claim 98, wherein, at a measurement timing where the end signal is not issued within a predetermined time period after the start signal is issued, the measurement monitoring means directs conclusion of reception of the sonic wave.

103. (NEW) A flowmeter according to claim 98, wherein, at a measurement timing where the end signal is not issued within a predetermined time period after the start signal is issued, the measurement monitoring means directs conclusion of reception of the sonic wave, and directs output of the start signal.

104. (NEW) A flowmeter according to claim 95, wherein the measurement monitoring means directs a stop in transmission/reception processing of the signal when the number of times that the transmission/reception of the signal is repeated is abnormal.

105. (NEW) A flowmeter according to claim 98, wherein the measurement monitoring means compares a first number of repetition times for measurement, where a sonic wave is transmitted from a first one of the pair of vibration means and received by the second vibration means, and a second number of repetition times for measurement, where a sonic wave is transmitted from the second vibration means and received by the first vibration means, and when the difference between the first number of repetition times and the second number of repetition times is equal to or greater than a predetermined number of times, the measurement monitoring means directs output of the start signal.

106. (NEW) A flowmeter according to claim 98, wherein a first number of repetition times for measurement where a sonic wave is transmitted from a first one of the pair of vibration means and received by the second vibration means is set so as to be equal to a second number of repetition times for measurement where a sonic wave is transmitted from the second vibration means and received by the first vibration means.

107. (NEW) A flowmeter according to claim 98, wherein the measurement monitoring means limits the number of times that the start signal is output to a predetermined number of times or less, such that the outputting of the start signal is not permanently repeated.

108. (NEW) A flowmeter according to claim 95, wherein the flow rate detection means detects a flow rate of the fluid based on a difference between inverse numbers of propagation times of the state change of the fluid when the transmission/reception of the signal is repeated.

109. (NEW) A flowmeter, comprising:

instantaneous flow rate detection means for detecting an instantaneous flow rate of fluid;

fluctuation determination means for determining whether the instantaneous flow rate of the fluid pulses or not; and

stable flow rate calculation means for calculating a stable flow rate of the fluid by using different flow rate calculation programs based on the instantaneous flow rate value measured by the instantaneous flow rate detection means according to a determination result of the fluctuation determination means.

110. (NEW) A flowmeter, comprising:

instantaneous flow rate detection means for detecting an instantaneous flow rate of fluid;

filter processing means for removing a pulse flow rate component of the instantaneous flow rate of the fluid by digital filter-processing the instantaneous flow rate of the fluid which is detected by the instantaneous flow rate detection means; and

stable flow rate calculation means for calculating a stable flow rate of the fluid based on an output from the filter processing means.

111. (NEW) A flow meter according to claim 110, further comprising fluctuation determination means for determining whether the instantaneous flow rate of the fluid pulses or not,

wherein, when the fluctuation determination means determines that the instantaneous flow rate of the fluid pulses, the stable flow rate calculation means calculates a stable flow rate of the fluid based on an output from the filter processing means.

112. (NEW) A flowmeter according to claim 109, wherein the fluctuation determination means determines whether the instantaneous flow rate of the fluid pulses or not, by determining whether or not a variation amplitude of the instantaneous flow rate of the fluid is equal to or greater than a predetermined value.

113. (NEW) A flowmeter according to claim 111, wherein the fluctuation determination means determines whether the instantaneous flow rate of the fluid pulses or not, by determining whether or not a variation amplitude of the instantaneous flow rate of the fluid is equal to or greater than a predetermined value.

114. (NEW) A flowmeter according to claim 110, wherein the filter processing means modifies a filter characteristic according to a variation amplitude of the instantaneous flow rate of the fluid.

115. (NEW) A flowmeter according to claim 110, wherein, when the instantaneous flow rate of the fluid which is detected by the instantaneous flow rate detection means is lower than a predetermined flow rate, the filter processing means removes a pulse component of the instantaneous flow rate of the fluid.

116. (NEW) A flowmeter according to claim 110, wherein the filter processing means modifies a filter characteristic according to the instantaneous flow rate of the fluid.

117. (NEW) A flowmeter according to claim 110, wherein the filter processing means modifies a filter characteristic according to an interval of measurement times of the instantaneous flow rate detection means.

118. (NEW) A flowmeter according to claim 117, wherein, when the flow rate is high, the filter processing means modifies a filter characteristic such that a cut-off frequency of the filter characteristic becomes high, and when the flow rate is low, the filter processing means modifies the filter characteristic such that the cut-off frequency of the filter characteristic becomes low.

119. (NEW) A flowmeter according to claim 110, wherein the filter processing means modifies a filter characteristic such that a variation amplitude of the stable flow rate calculated by the stable flow rate calculation means is within a predetermined value range.

120. (NEW) A flowmeter according to claim 109, wherein the instantaneous flow rate detection means detects the instantaneous flow rate by using an ultrasonic wave.

121. (NEW) A flowmeter according to claim 110, wherein the instantaneous flow rate detection means detects the instantaneous flow rate by using an ultrasonic wave.

122. (NEW) A flowmeter according to claim 109, wherein the instantaneous flow rate detection means detects the instantaneous flow rate by using heat.

123. (NEW) A flowmeter according to claim 110, wherein the instantaneous flow rate detection means detects the instantaneous flow rate by using heat.

124. (NEW) A flowmeter, comprising:

a flow rate measurement section through which fluid to be measured flows;

a pair of ultrasonic wave transducers provided in the flow rate measurement section for transmitting/receiving an ultrasonic wave;

a driver circuit for driving one of the ultrasonic wave transducers;

a reception detecting circuit connected to the other one of the ultrasonic wave transducers for detecting an ultrasonic wave pulse;

a timer for measuring a propagation time based on a receipt detection timing of the ultrasonic wave pulse;

a control section for controlling the driver circuit;

a calculation section for calculating a flow rate of the fluid to be measured based on an output from the timer; and

periodicity change means for sequentially changing a driving method of the driver circuit,

wherein the control section controls the periodicity change means such that the frequency of transmission/reception signal in flow rate measurement based on the propagation time of the ultrasonic wave pulse is sequentially changed.

125. (NEW) A flowmeter, comprising:

a flow rate measurement section through which fluid to be measured flows;

a pair of ultrasonic wave transducers provided in the flow rate measurement section for transmitting/receiving an ultrasonic wave;

a driver circuit for driving one of the ultrasonic wave transducers;

a reception detecting circuit connected to the other one of the ultrasonic wave transducers for detecting an ultrasonic wave pulse;

a control section for controlling the driver circuit for a predetermined number of times so as to drive the one of the ultrasonic wave transducers again based on an output from the reception detecting circuit;

a timer for measuring an elapsed time for the predetermined number of times;

a calculation section for calculating a flow rate of the fluid to be measured based on an output from the timer; and

periodicity change means for sequentially changing a driving method of the driver circuit,

wherein, the control section changes the driving method with the periodicity change means every time a receipt of the ultrasonic wave pulse is detected by the reception detecting circuit.

126. (NEW) A flowmeter according to claim 124, wherein:

the periodicity change means switchingly outputs a plurality of output signals having different frequencies; and

the control section changes a driving frequency of the driver circuit by changing a frequency setting of the periodicity change means at every flow rate measurement.

127. (NEW) A flowmeter according to claim 125, wherein:

the periodicity change means switchingly outputs a plurality of output signals having different frequencies; and

the control section changes a driving frequency of the driver circuit by changing a frequency setting of the periodicity change means at every flow rate measurement.

128. (NEW) A flowmeter according to claim 124, wherein:

the periodicity change means outputs output signals having the same frequency and a plurality of different phases; and

the control section changes a driving phase of the driver circuit by changing a phase setting of an output signal of the periodicity change means at every flow rate measurement.

129. (NEW) A flowmeter according to claim 125, wherein:

the periodicity change means outputs output signals having the same frequency and a plurality of different phases; and

the control section changes a driving phase of the driver circuit by changing a phase setting of an output signal of the periodicity change means at every flow rate measurement.

130. (NEW) A flowmeter according to claim 124, wherein:

the periodicity change means outputs a synthesized signal obtained by superposing a signal of a first frequency which is an operation frequency of the ultrasonic wave transducers and a signal of a second frequency which is different from the first frequency; and

the control section outputs, through the driver circuit, at every flow rate measurement, an output signal where the second frequency of the periodicity change means is changed.

131. (NEW) A flowmeter according to claim 125, wherein:

the periodicity change means outputs a synthesized signal obtained by superposing a signal of a first frequency which is an operation frequency of the ultrasonic wave transducers and a signal of a second frequency which is different from the first frequency; and

the control section outputs, through the driver circuit, at every flow rate measurement, an output signal where the second frequency of the periodicity change means is changed.

132. (NEW) A flowmeter according to claim 130, wherein the periodicity change means changes the setting between a case where there is a second frequency and a case where there is not a second frequency.

133. (NEW) A flowmeter according to claim 130, wherein the periodicity change means changes the phase setting of the second frequency.

134. (NEW) A flowmeter according to claim 130, wherein the periodicity change means changes the frequency setting of the second frequency.

135. (NEW) A flowmeter according to claim 125, wherein:

the periodicity change means includes a delay section in which different delay times can be set; and

the control section changes a delay time set in the delay section every time transmission or reception of an ultrasonic wave is detected.

136. (NEW) A flowmeter according to claim 124, wherein the width of a cycle of the frequency changed by the periodicity change means is a multiple of a value corresponding to a propagation time variation which is caused by a measurement error.

137. (NEW) A flowmeter according to claim 125, wherein the width of a cycle of the frequency changed by the periodicity change means is a multiple of a value corresponding to a propagation time variation which is caused by a measurement error.

138. (NEW) A flowmeter according to claim 124, wherein a width of a cycle of the frequency changed by the periodicity change means is equal to a cycle of a resonance frequency of the ultrasonic wave transducers.

139. (NEW) A flowmeter according to claim 125, wherein a width of a cycle of the frequency changed by the periodicity change means is equal to a cycle of a resonance frequency of the ultrasonic wave transducers.

140. (NEW) A flowmeter according to claim 124, wherein the order of patterns for changing the periodicity is the same for both measurement in an upstream direction and measurement in a downstream direction.

141. (NEW) A flowmeter according to claim 125, wherein the order of patterns for changing the periodicity is the same for both measurement in an upstream direction and measurement in a downstream direction.

142. (NEW) A flowmeter according to claim 125, wherein the predetermined number of times is a multiple of a change number of the periodicity change means.

143. (NEW) A flowmeter, comprising:

a flow rate measurement section through which fluid to be measured flows;

a pair of ultrasonic wave transducers provided in the flow rate measurement section for transmitting/receiving an ultrasonic wave;

a driver circuit for driving one of the ultrasonic wave transducers;

a reception detecting circuit connected to the other one of the ultrasonic wave transducers for detecting an ultrasonic wave pulse;

a first timer for measuring a propagation time of the ultrasonic wave pulse;

a second timer for measuring a time period from a time when the reception detecting circuit detects a receipt of the ultrasonic wave pulse to a time when a value of the first timer changes;

a control section for controlling the driver circuit; and

a calculation section for calculating a flow rate of the fluid to be measured, based on outputs from the first timer and second timer,

wherein the second timer is corrected by the first timer.

144. (NEW) A flowmeter according to claim 143, further comprising a temperature sensor, wherein the second timer is corrected by the first timer when an output from the temperature sensor varies so as to be equal to or greater than a set value.

145. (NEW) A flowmeter according to claim 143, further comprising a voltage sensor, wherein the second timer is corrected by the first timer when an output from the voltage sensor varies so as to be equal to or greater than a set value.

146. (NEW) A flowmeter, comprising:

a flow rate measurement section through which fluid to be measured flows;

a pair of ultrasonic wave transducers provided in the flow rate measurement section for transmitting/receiving an ultrasonic wave;

a driver circuit for driving one of the ultrasonic wave transducers;

a reception detecting circuit connected to the other one of the ultrasonic wave transducers for detecting an ultrasonic wave pulse;

a control section for controlling the driver circuit for a predetermined number of times so as to drive the one of the ultrasonic wave transducers again based on an output from the reception detecting circuit;

a timer for measuring an elapsed time for the predetermined number of times;

a calculation section for calculating a flow rate of the fluid to be measured based on an output from the timer; and

periodicity stabilizing means for sequentially changing a driving method of the driver circuit,

wherein the control section controls the periodicity stabilizing means such that a measurement frequency is always maintained to be constant.

147. (NEW) A flowmeter according to claim 146, wherein: the periodicity stabilizing means includes a delay section in which different delay times can be set; and the control section changes an output timing of the driver circuit by switching the delay times set in the delay section.